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3 January 1983

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 173

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CONTENTS

EAST EUROPE

CZECHOSLOVAKIA

Gerle Signs Nuclear Power Plant Pact With USSR
(CTK, 8 Dec 82) 1

Preparations for Nuclear Plant Construction Begin
(SVET HOSPODARSTVI, 4 Nov 82) 2

Husak Discusses USSR-CSSR Nuclear Cooperation
(Editorial Report) 3

LATIN MERICA

ARGENTINA

Experts Meet To Discuss Latin American Nuclear Integration
(ENERGEIA, Nov 82) 4

NEAR EAST AND SOUTH ASIA

PAKISTAN

Pakistan's Right to Nuclear Technology Asserted
(Editorial; NAWA-I-WAQT, 15 Nov 82) 13

Opposition to Nuclear Weapon Free Zones Criticized
(DAWN, 1 Dec 82) 15

Pakistan Receives Nuclear Program Bids
(M. Ziauddin; DAWN, 12 Dec 82) 16

Pakistan's Steps for Safeguards Reviewed
(Syed Sikander Mehdi; DAWN, 3 Dec 82) 20

SUB-SAHARAN AFRICA

SOUTH AFRICA

Escom Denies Involvement in Developing Nuclear Arms
(Chris Olckers; RAND DAILY MAIL, 30 Nov 82) 22

Cape Radiation Unit for Tygerberg Hospital
(RAND DAILY MAIL, 1 Dec 82) 23

ZIMBABWE

Pelindaba Considered Key to US-SA Nuclear Bonds
(THE SUNDAY MAIL, 28 Nov 82) 24

WEST EUROPE

FRANCE

Briefs

Rhapsodie Reactor Halted 26
Creys-Malville Breeder Reactor Financing 26
Better 1983 Nuclear Plant Performance 26

ITALY

Specifications for Heavy Ion Linear Accelerator Tandem XTU
(SCIENZA E VITA NUOVA, Nov 82) 27

SPAIN

Safety of Almaraz Nuclear Power Plant Questioned
(Jesus Rivases, et al.; TIEMPO, 18/25 Oct 82) 29

CZECHOSLOVAKIA

GERLE SIGNS NUCLEAR POWER PLANT PACT WITH USSR

LD081932 Prague CTK in English 1710 GMT 8 Dec 82

[Text] Moscow [no date as received] -- Soviet and Czechoslovak deputy premiers Aleksey Antonov and Ladislav Gerle ended here today their discussions on the fulfillment of a program of bilateral cooperation in nuclear power engineering.

They especially discussed and signed a protocol on the participation of Soviet organizations in the building of several Czechoslovak nuclear power plants, e.c. in Jaslovske Bohunice, Dukovany, Mochovce and the first part of the nuclear power plant in Temelin.

Aleksey Antonov and Ladislav Gerle reviewed some aspects of the Czechoslovak-Soviet cooperation in the production of equipment for nuclear power plants and questions connected with their operation.

The two representatives also signed an inter-governmental agreement on bilateral cooperation in the building of the second part of the nuclear power plant in Temelin, South Bohemia. This power plant will have two power 1,000-megawatt units. The Soviet Union will design this major project, ensure the organization of the construction and supply the equipment in harmony with the agreement on multilateral international specialization and cooperation in production and mutual supplies of equipment for nuclear power plants for 1981-1990, signed [words indistinct] the framework of the CMEA in 1979.

CSO: 5100/3007

PREPARATIONS FOR NUCLEAR PLANT CONSTRUCTION BEGIN

WA010800 Prague SVET HOSPODARSTVI in Czech 4 Nov 82 p 1

[Excerpt] The preparations for construction of the most efficient nuclear power plant in the CSSR have started in the northwest section of the Okres Ceske Budejovice. According to plans, the project is to generate 2 times 1000 MW with the potential of doubling the capacity in later years. Preparatory work, site preparations and other preparatory construction for 1984 and beyond have been scheduled as projected in the Seventh 5 Year Plan, with a target date for the start-up early in 1991.

However, a number of actions have to be taken before that date. The preparations are now concentrating on build-up of the approacn routes as, for example, a by-pass of the Kraj seat, also construction of living quarters and offices for investors, design and production work force are underway. In Tyne and Vltavou, the town closest to the construction site, is expected to have a bed capacity of about one thousand. Similarly, in Ceske Budejovice, the Pozemni Stavby is preparing a hotel residence, catering facilities, and radiation laboratories.

The nuclear power plant will also require extensive adjustments to the water system management in this region. The water for the operations will, for example, be pumped from the available Hnevkovice water storage facility, another section of the Vltava cascades. This construction is expected to begin in 1986.

CSO: 5100/3007

CZECHOSLOVAKIA

HUSAK DISCUSSES USSR-CSSR NUCLEAR COOPERATION

AU261922 [Editorial Report] Prague RUDE PRAVO in Czech on 22 October 1982 carries on pages 1, 2 a 1,300-word report by Gustav Capko and Frantisek Mucha, entitled "Among Power Engineering Workers and Agricultural Workers: Second Day of Comrade Gustav's visit to the West Slovak Region." In reporting on Husak's visit to the nuclear power station in Jaslovske Bohunice, the authors state, among other things:

"Artem Grigoryants, head of the groups of Soviet experts, spoke about Soviet-Czechoslovak cooperation in the sphere of nuclear power engineering and about the experience acquired by the experts of the two countries in the construction and operation of the power stations in Jaslovske Bohunice. He underscored the high standards of Czechoslovak nuclear power stations, the high quality of technical work and the great political activity of the employees. He recalled that the reliable operations of these installations having a complicated technology places extraordinary demands on the professional maturity of employees. One should bear in mind that this is a new power engineering sector which must be purposedully developed."

CSO: 5100/3007

EXPERTS MEET TO DISCUSS LATIN AMERICAN NUCLEAR INTEGRATION

Buenos Aires ENERGEIA in Spanish Nov 82 No 30 pp 708-712

[Article: "Proposals for Latin American Nuclear Integration"]

[Text] On Friday, 5 November, a meeting convoked by the chairman of the Federation of Latin American Nuclear Associations (FANAL), Dr Raul A. Boix Amat, was held in Buenos Aires by a group of professionals from various Latin American countries who are associated with nuclear industry, engineering and research. The purpose of the meeting was an exchange of ideas concerning an agenda comprised of four points: the regional integration of nuclear industry and engineering, the coordination of the regional demand for extra-regional technology, the transfer of nuclear technology and the multinational projects.

Participating in the discussions, among others, were Engs Armando Granado, Leancy Clemente and Frank Huerta, from Venezuela; Jose Dellepiane, from Peru; Jorge Servian, Alvaro Musso and Gabriel Bernasconi, from Uruguay; Antonio Mueller, Jorge Spitalnk and Farhang Sefidvash, from Brazil; Oscar Caballero Garcia and Conrado Capoto, from Cuba; and Martinez Favini, Alfredo Carpeles, Renato Radicella, Jorge Cosentino and Raul A. Boix Amat, from Argentina. Also in attendance was Dr Jaime Pahissa Campa, chairman of the Argentine Nuclear Technology Association (AATN), at whose headquarters the meeting took place, and Laura Guardia Bossi, from the Venezuelan Embassy in the Argentine Republic.

The presence of Eng Jorge Cosentino, from Argentina, who heads the Latin American branch of the American Nuclear Society, with headquarters in Brazil, and that of some Brazilian professionals affiliated with that prestigious United States society, lent the meeting sponsored by FANAL a certain political tone, which was manifested in a rather unopen psychological mood on the part of some delegates. Nevertheless, several interesting proposals could be gleaned, as well as clearcut general support for the goal of nuclear complementation among the countries of the region.

Boix Amat: "The Federation of Latin American Nuclear Associations (FANAL) has deemed it feasible to have in Buenos Aires the presence of distinguished Latin American professionals associated with nuclear activity to exchange views on nuclear topics of regional concern. The proposal for this meeting originated among the attendees at the Second International Conference on Transfer of Nuclear Technology, which took place in Buenos Aires and which has now ended. We met informally, our only representative status being that we were Latin Americans working on behalf of the nuclear development of the countries in the region. It is our purpose to have an exchange of opinions on matters relating to the common interest, such as the integration of the regional nuclear industry and engineering, the coordination of the regional demand for extra-regional nuclear technology, the horizontal transfer of nuclear technology and, finally, the multinational projects which could be carried out in the region. All these subjects will be discussed from two angles: necessity and proposals. FANAL thinks that the views of each one of us will be extremely useful for its task of fostering the harmonious development of nuclear programs in the region.

"As for the first point on the agenda, I consider the integration and complementation of nuclear engineering and industry in the region to be both necessary and feasible: necessary, to achieve harmonious development of all the countries in the region in the nuclear field; and feasible, because, in view of the shortage of resources that typifies our countries, integration is, in my opinion, the most suitable method for making better use of the existing resources and, in this way, hastening development."

Dellapiane: "The need for integration has already been recognized in Peru and, as a result of this recognition, it has gone so far as to formalize integration with Argentina on the regional level. This complementation is taking place not only in the industrial aspect, but in the technological one as well. Hence, we fully agree that this is necessary and useful for more rapid advancement in the special field."

Servian: "I believe that Latin America should learn from Europe about achieving integration and cooperation among countries. Complementation is the best course of action at present for progress among nations, particularly among those which, like the ones in this region, have similar problems and common interests."

Granado: "Our nuclear industry at just at its beginning, but we are attempting to incorporate information and to learn from the more advanced countries. Complementation is, therefore, a very suitable means for attaining what we have proposed for ourselves."

Musso: "My country's experience relating to this first area is virtually nil. I think that, in the first place, we should determine what we want to do, why we want to do it and how we want to do it. If we really wish to achieve the integration that is being sought, we must not confine ourselves to statements of good intentions. LAFTA and LAIA are two obvious examples of what is achieved with good intentions alone."

Martinez Favini: "I might add to what has been said that the factors of an historical, legal, political and social type at work in the region are now compounded by the fact that we have embarked fully on an atypical world crisis, which will unquestionably continue until the end of the century, and which, for that very reason, requires common strategies for coping with the present and future difficulties."

Radicella: "We could mention a concrete experience with what Dellepiane has already referred to: a beginning of industrial integration and engineering with Peru. The experience gained has been excellent, and hence I think that integration, over a broad area, is obviously feasible and highly beneficial."

ENERGEIA: "We have now reached the topic of the proposals. In our view, what would be required in this case is a contribution of ideas aimed at achieving that integration between nuclear industry and engineering in Latin America. Hence, it would be interesting to describe the mechanisms that you consider most efficient for creating that integration on which we are all basically agreed."

Boix Amat: "As chairman of FANAL, I think that this federation, which combines the region's nuclear associations, and which will gradually be joined by other entities and business forms associated with nuclear activity, is an ideal forum for debating and studying these matters in depth. Included among the entity's goals is, precisely, that of promoting and conducting studies that will make it possible to identify the most effective mechanisms for industrial complementation, and that will also allow for guiding regional nuclear development. Nevertheless, I think that the mechanisms for industrial complementation existing in the world are well known, and we should not reject any of them a priori.

"The auspicious aspect of this challenge is that Latin America, in the area of nuclear energy, is at an incipient stage of industrialization; and therefore, unlike other industries, complementation and integration do not imply the closing of facilities, but merely coordinating the growth. I am personally convinced that, without this complementation, it will be impossible for some countries of the region to attain an adequate degree of autonomy in the area of generating nuclear electric power; and if one achieves this in isolated fashion, it will have done so with great sacrifices, at a significant cost and over sizable periods of time."

Dellepiane: "If we are talking about proposals, I cannot fail to take as a reference what we are doing with Argentina. It is a great step, and I consider it constructive. In any event, it is necessary to proceed in stages, so that, starting with a complementation on a small or medium scale, there can be increments toward commitments of greater scope. In my opinion, this would ensure more solid and effective integration. Moreover, FANAL has very concrete opportunities for contributing ideas and proposals for accelerating that industrial and technological integration which we desire for the region.

"However, it is necessary, assuming a calculated risk, that we start creating this integration; because otherwise everything would be confined to words and good intentions, and nothing more, as Musso noted a moment ago."

Servian: "In my view,the integration must necessarily result from a decision by the governments,and institutions and entities associated with the nuclear energy field; and therefore such action must consider political, economic and technical aspects that are sufficiently well calibrated not to bring about subsequent problems."

Spitalnik: "I had not intended to talk, because I came to this meeting as an observer; but there is something which disturbs me. At this meeting, we are answering questions on which we might be agreed as professionals and as individuals; but I wonder what significance these opinions will have in terms of valid conclusions pertaining to possible integration policies."

Musso: "I have come here as a civilian, to a meeting which I know is informal, and not in my capacity as director of merchant marine; nor have I come as a member of the Nuclear Research Center, with which I am affiliated. I am chairman of the Uruguayan Nuclear Technology Society, which is a civilian organization. Therefore, I am attending in that capacity, as a civilian who agrees with the need to contribute ideas aimed at an integration which is necessary for all of Latin America. We are not speaking on behalf of any government or any institution; but this does not detract value from the views expressed here, because the intention that inspires us is to contribute to an accomplishment that is constructive for all the nations of the region."

Clemente: "I consider it difficult, and even fruitless to talk about integration when individuals make their private interests prevail over those of the community to which they belong. There are in Latin America many institutions which have been created for purposes of regional integration; but those desires have almost always been thwarted, because when it is time to make decisions, the personal or group interests carry more weight than national or regional ones. Therefore, the first obstacle that we must surmount is this concealed, but very obvious and negative position that is detrimental to the cooperation among our countries. If we do not achieve this, none of what is said here, regardless of how important it may be, will be of any value."

ENERGEIA: "Perhaps a reminder is necessary that this meeting (although it is informal) has a clearcut goal. Hence, if we are here it is to contribute ideas that may serve as a basis, at least as background information, for the search for mechanisms directed toward integration. What concerns us to learn about the ideas and proposals from each one of you regarding that goal."

Clemente: "Fine. In Venezuela, the so-called 'Andean Subregional Program,' consisting of Venezuela, Colombia, Ecuador, Peru and Bolivia, has already gone into effect. It is receiving contributions from IAEA and other agencies, and its goals have already been clearly set. This program covers all areas relating to the incipient development of the Andean countries in the nuclear field.

"So here we have an example of five countries which have combined for a particular purpose, and they are working together. Now I think that, if we could extrapolate this model to a larger region, we would find that a regional agreement of this type is entirely possible. Venezuela could offer as a reference the mechanism used for this agreement, and I think that it would serve not only to progress toward the formalization of similar agreements, but also to avoid the mistakes that we made and that we must correct along the way."

Boix Amat: "I consider the example of the Andean Subregional Program to be highly positive, and I think that we in FANAL should foster this type of agreement. From the remarks just made by Eng Clemente, there appears the feasibility of spreading and promoting these agreements, so as to apply them to the entire region."

Martinez Favini: "I would like to emphasize what Clemente has said, because what has been accomplished by the Andean Pact has shown us a basic requisite needed for the integration, namely, the political, social and economic organization that must take place in a country, as a requirement for complementation with another one in any particular activity, enterprise or project. This is an example of institutional courage given to us by the Andean countries, one that I consider a genuine prerequisite for any attempt at regional integration; because, for this, political stability among the signatory countries is basically required."

Radicella: "The experience that we have gained as a result of the agreement with Peru has shown us that there are suitable mechanisms for formalizing models of integration. From an industrial standpoint, the construction of the Nuclear Center received basic engineering from Argentina, and the detail engineering has been provided by Peru, through companies in that country. Moreover, in many of the contracts pertaining to Argentina, an attempt has been made to have Peruvian associates participate, providing for part of the supplies and working in Peruvian companies.

"To be sure, this is not such a perfect model that it should be taken as an example. but at any rate I think that it could serve as a reference, because it has proven to work well."

Cabrera Majoni: "I would like to recall what was said by the Argentine delegate to the Second ICONTT, to the effect that, in reality, a true transfer of technology does not exist, but rather, there are purchasers and sellers of technology. I agree with this assessment, because it is what one notes constantly in the field of nuclear energy. For this reason, I hope that FANAL will make an effective contribution toward preventing this from happening in Latin America; because, when the transfer of technology is authentic, and handled correctly, a real reduction in costs is achieved."

Carpele: "Upon reading the agenda for this meeting, I paused on the fourth point (multinational projects) and thought that the basic problems crop up in the area of the 'multinationals,' in other words, when more than two countries are involved in an agreement. The agreements (in my opinion) prove to be more difficult the larger the number of associates participating in them. This generally occurs because groups with different interests and with unequal power tend to form. All of this impedes an attempt at integration, but it does not mean that we should give up that proposal. What we should do is take those factors into consideration, so as to prevent them. Integration should be carried out in the nuclear area, and we should all contribute to it."

Cosentino: "In order to speak seriously about industrial and engineering integration, we must start with a 'timing' of objectives of each of the parties seeking the integration. We must determine 'who wishes to do what in a certain amount of time.' Once this has been determined, the search for integration can begin; but if we do it in reverse, without knowing what we can do, or in how much time, we shall not get anywhere.

"Although the field of nuclear energy is very vast, I would be inclined to talk about what we have experience in; and, in this instance, I think that we can talk about what we know how to do in the area of research reactors and their associated facilities, and the power plants. I think, in the case of powerplants, that very few Latin American countries can have a sufficiently immediate future to make it worthwhile to coordinate efforts and implement measures. If Argentina, Brazil and Mexico are not present at this table, I don't know whether it makes any sense to talk about integration, at least with really serious intentions.

"In the field of research reactors,which is the other example, it has become clear that agreements can be achieved when there are previously determined goals, and suppliers to meet the needs produced by the project. This holds true for the agreement between Argentina and Peru, wherein those requirements have been fulfilled.

"It is for this reason that I stress that the first goal which must be set is to gather around a table those countries that already have a platform of technology, engineering and services in the nuclear energy field, so as to find out what can be accomplished jointly by other countries in the region that want to develop in this area.

"Once the needs have been established, it will be possible to move to another phase, consisting of a coordination of efforts to carry out the projects introduced by the demand."

Boix Amat: "Regarding the concern voiced by Eng Cosentino, I would like to report that, in March of this year, FANAL began a series of consultations with the atomic energy commissions of Latin America and other agencies and business firms in the region engaged in activities in the nuclear field, for the purpose of learning about their programs, aspirations and initiatives, and thereby being able to procure the basic information that is essential for making compatibility studies which could be useful to everyone alike."

Cosentino: "That is all very good, but if FANAL requests information of atomic energy commissions which are not represented in this entity, as in the case of the Brazilian one, for example, I wonder whether we are really witnessing a serious attempt at integration. I say this because it might be thought that the information which is supplied could serve Argentina's commercial interests for the benefit of its industry, and not the spirit of Latin American complementation that this federation is claimed to champion. This is why I am concerned about our discussing these matters, when countries with nuclear development such as Brazil or Mexico are not represented in FANAL."

Mueller: "I consider the point cited by Eng Cosentino to be extremely important; because, in fact, there is in Latin America more than one country in a position to offer a transfer of nuclear technology. Hence, I am concerned about the representative status of this forum, because I don't know whether it has the scope that it claims."

ENERGEIA: "We remind the gentlemen participating in this meeting that the discussion of this point is taking us away from the issue that we are dealing with, namely, the proposals for integration."

Boix Amat: "Allow me to point out, by way of explanation, that FANAL is a Latin American federation and, as is clearly stipulated in its bylaws, it does not belong to Argentina, nor to Brazil, nor to Mexico, nor to any country or entity in particular, nor does it promote any individual sector. On the contrary, it grants identical rights to the nuclear technology associations of all the Latin American countries, and affords an opportunity for membership to all the entities and business firms interested in nuclear activity in the region. The members of FANAL do not officially represent the country to which they belong. For this reason, the dialog among FANAL members can be frank and open, and it can produce objective recommendations which, if taken into account by those who decide on each country's nuclear policy, will surely work to the benefit of all the peoples of the region."

Clemente: "In my opinion, it is disturbing that FANAL is not submitting a proposal for integration at this table; because it is responsible for producing proposals of this type for the region. Therefore, since there are no concrete proposals, I take the liberty of stressing the example of the Andean Subregional Program, so that this model may be observed and it may be extrapolated to other regions."

Martinez Favini: "I would like to emphasize a view that I have already voiced but that I deem important. What is involved here is not an attempt to arrive at complete integration, and perhaps not even at halfway integration. What is important is to assume a mental attitude for integrating negotiating power in the crisis besetting the world; because it is obvious that the developed countries will attempt to pass on to us underdeveloped countries the recessive effects of a crisis that will be with us until the end of the century. The decision to integrate (that is, the psychological mood for becoming united) is the one that we must arouse in our countries, so as to cope with the circumstances and not continue to succumb, as we have thus far, to the trap of division, which leads to no good."

ENERGEIA: "Let us now discuss the second point on the agenda, dealing with the regional demand for extra-regional nuclear technology. It would be useful to be able to better express our ideas, so that we may really make progress on the agenda, and also to show a more constructive attitude and conduct in the comments that are made."

Boix Amat: "With regard to the coordination of the regional demand for extra-regional nuclear technology, I would say that it prompts us to explore the possibility of giving better treatment to the problems which arise from the vertical transfer of technology. As has already been pointed out by the delegates from Uruguay, the transfer of technology is becoming increasingly a sale of technology. Hence, I believe that, in order to accrue better results from these negotiations, it would be necessary and feasible to coordinate and pool the demand for technology. We must bear in mind that the Latin American countries as a whole constitute a major source of demand for nuclear technology. Therefore, when we acquire an awareness of the negotiating power that this represents, the coordination of this demand will be everyone's goal."

Radicella: "In the matter of horizontal transfer of technology, that is, the type that is carried out between countries on a similar level, I would like to point out that it has an economic aspect which, although obvious, should be taken into account; because it is something different from that existing in the vertical transfer of technology stemming from highly developed countries. In the latter instance, the economic cost is always greater, and the commitments created by that supply of technological resources are greater. In the case of the horizontal transfer, there is also the advantage represented by dealing with similar resources, thus allowing for solutions which are easier, faster,and having a lesser political cost.

"Moreover, in these instances, it is far more possible for the country receiving the technology to be able to develop its own innovations, and that is certainly not insignificant."

Boix Amat: "Concerning the need for carrying out multinational projects in Latin America (the last point on the proposed agenda), I would like to note that this has become necessary owing to the meagerness of our resources; and it is a correct way of achieving a better utilization of the individual capacities of each of the nations.

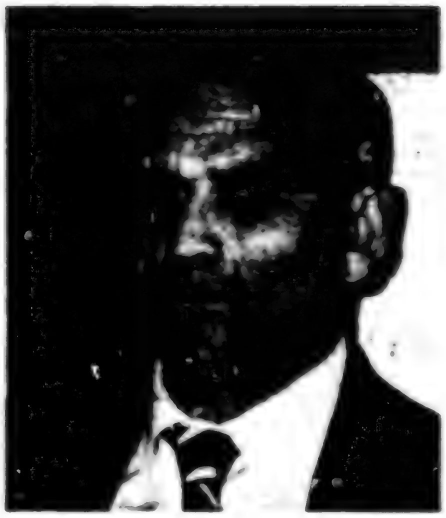
"As for proposals, I would like to make one that will certainly not be easy to implement, but that I regard it as fitting to mention. You know that the nuclear development programs are generally aimed at the building of nuclear powerplants and various facilities for the fuel cycle. Having free access to the fuel and other input is what ensures the necessary autonomy of a country to generate energy. All the national programs in Latin America and in the developing countries in general have encountered serious difficulties in completing the necessary facilities to ensure control of the fuel cycle, owing to the non-proliferation policy imposed by the developed countries. For this reason, my proposal is that this type of facility, affected by different conditioning factors, become an object of multinational projects. In addition to the obvious economic benefit, this would have appreciable political significance in the eyes of the highly developed nations, which would in this way see a united Latin America, with a strong determination to have mutual complementation, so as to obtain free access to the benefits afforded by the peaceful use of nuclear energy and, at the same time, it would dispel the worries that these national programs produce among the big powers."

Musso: "I agree with Dr Boix Amat concerning the limits imposed by the developed countries in the area of sensitive technology, using nuclear proliferation as an excuse. There has even been an attempt to impose these limitations on countries which have signed the Treaty of Tlatelolco. So, I fully agree on the need for our countries to undertake, on their own, the development of independent nuclear programs.

"As for the horizontal transfer of technology, I can attest to its good results, because of the work that we performed at one time with the CNEA [National Atomic Energy Commission]. When the Nuclear Center was created, countless technical problems were solved thanks to that facility; and, in addition, it became possible to progress internally, starting on a level that was accessible to us, both in the technical and the political area."

Boix Amat: "I would like to thank all of you for your presence at this meeting, and for the valuable and interesting opinions expressed; and, in particular, the magazine ENERGEIA, which has covered and guided our conversations."

Dr Raul Boix Amat



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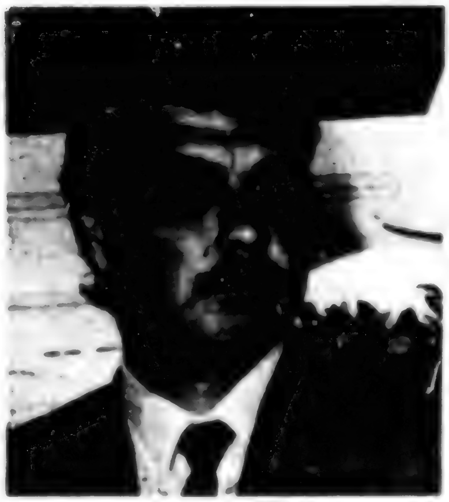

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PAKISTAN'S RIGHT TO NUCLEAR TECHNOLOGY ASSERTED

Lahore NAWA-I-WAQT in Urdu 15 Nov 82 p 3

[Editorial: "The Issue of Nuclear Technology"]

[Text] During his press conference, President Zia made it clear that in exchange for U.S. economic aid and a long-term program for the sale of weapons, the United States had not asked for any bases in exchange; Pakistan had made it clear that it would not make any bases available to America in exchange for its aid. Addressing the Rotary Club in Boston the other day, Pakistan's ambassador to the United States, Lt Gen Ejaz Azim, said more or less the same thing; he stated that the United States considered the strengthening of Pakistan's defenses sufficient compensation for its aid.

India and some other countries in tune with Russia have been raising the spectre of American bases even though none of these countries can claim that they are fulfilling the basic conditions of nonalignment, whereas Pakistan can claim with confidence and pride that it is nonaligned in the true sense of the word. It can offer as proof of this claim the fact that it did not bow before American pressure regarding Pakistan's atomic program; and despite Russian intimidation against a peaceful solution of the Afghanistan problem, Pakistan did not budge the slightest from its principle and its stand. Anyway, the United States is no longer in any great need of bases in other countries. It has strong bases in every ocean of the world, including the Indian Ocean, that are capable of every kind of use; and American satellites allow that country to know in detail what is going on in every part of the world. In spite of the comprehensive talks that have taken place on every aspect of the sale of arms to Pakistan, some American circles have been saying certain things about Pakistan's limited and peaceful atomic program; hence, it is possible that when President Zia goes next month on a state visit to the United States, the influential pro-Indian Jewish lobby there and the communications media controlled by it will leave no stone unturned to play up the issue. But under even more unfavorable conditions in the past, the Zia government has persevered in its attitude of self-control and tolerance, and one can hope that it will not allow its stand to be affected by its tour of the United States. Access to nuclear technology is not only a basic necessity for Pakistan for energy purposes, but it is also a requirement nowadays for living in freedom and dignity. Aid from the United States or any other source cannot be an alternative for meeting these needs, nor will any such exchange be tolerated. Since the United States did not stop aid to Israel, South Africa and others even after they made atomic bombs, and it is supplying enriched atomic fuel to India even after that country set off a nuclear explosion, how can it raise any objections to Pakistan's atomic program, which is both peaceful and very limited in scope? The misleading hue and cry against this program has been raised by Western, especially Jewish, sources who are overcome by their prejudice against Muslims.

9863
CSO: 5100/4309

OPPOSITION TO NUCLEAR WEAPON FREE ZONES CRITICIZED

Karachi DAWN in English 1 Dec 82 p 13

[Text]

THE resolution on nuclear-weapon-free zones adopted by the UN General Assembly's Political and Security Committee on Saturday night speaks of the concern the world community feels over nuclear proliferation. It is significant that the resolution calling for further study to review and supplement a 1975 study on denuclearised zones was adopted by an overwhelming majority of 125 to one with two abstentions. That the UN members should feel that the earlier study has been overtaken by events within eight years is in itself indicative of the pace at which States are acquiring the capacity to use the nuclear option. Since the nuclear arms race has acquired such menacing proportions, with the superpowers possessing overkill nuclear capacity, it is not surprising that the non-nuclear countries should have sought to create zones free from nuclear weapons. Widespread support has been voiced for the concept, which is based on the understanding that the States in a region will not acquire, manufacture or stockpile nuclear weapons in the specified area and will submit to an international system of verification and control. Nations have concluded international agreements providing for the denuclearisation of the Antarctic, the outer space, the sea-bed and Latin America. The UN assembly has also adopted resolutions calling upon States to establish nuclear-weapon-free zones in Africa, the Middle East and South Asia although these have not so far been actually set up on account of resistance from those States in these areas which are on the threshold of becoming nuclear powers and do not wish to forego their prerogative to manufacture atomic weapons.

In spite of widespread support for nuclear-weapon-free zones, it is possible for even a single recalcitrant State in a region to block the creation of the zone. This was highlighted last week when the UN Assembly's First Committee endorsed for the ninth time Pakistan's proposal for the establishment of a nuclear-weapon-free zone in South Asia. India and Bhutan were the only two members to vote against the resolution. Given the lack of cooperation from these two countries of South Asia, it has not been possible to make any headway with the move to denuclearise the region. India has already exploded a nuclear device, in 1974, and is known to possess the capacity to manufacture nuclear weapons. Its stand on the denuclearised zone is also contrary to the known position of the other States in the region which wish to avoid a nuclear arms race at all costs. The Indian Government's contention that the concept of nuclear-weapon-free zones has become "obsolete" stands no scrutiny. The Indian representative insisted in the UN Committee that the use of nuclear weapons knew no national boundaries and threatened the security of all mankind. Hence he called for urgent measures to eliminate nuclear weapons on a world-wide basis. This no doubt is the ideal position on disarmament. But in a situation which is far from ideal, the nuclear powers having failed to reach agreement on nuclear arms cuts, let alone total nuclear disarmament, it would be unrealistic for the non-nuclear States not to explore other options to promote their own security. The establishment of nuclear-weapon-free zones might not be the perfect solution to the nuclear arms race which threatens mankind, but by defining areas from where nuclear weapons are to be kept out, Third World nations can at least create islands of security in the region in which they are located. The importance of this should not be underestimated, especially when nuclear-weapon-free zones offer the only mechanism whereby non-nuclear Third World countries can continue to stay non-nuclear and concentrate their resources and energies on economic and social development.

CSO: 5100/4312

PAKISTAN RECEIVES NUCLEAR PROGRAM BIDS

GF131436 Karachi DAWN in English 12 Dec 82 p 1

[By M. Ziauddin from Islamabad]

[Text] Three countries, West Germany, Belgium and Switzerland are said to have evinced keen interest in the tenders floated by Pakistan on 1 December, this year, inviting international bidders and various qualified suppliers for the construction of a 900 MW nuclear power station at Chashma, 170 miles from Islamabad.

Knowledgable circles attribute the quick response to the acute and continuing depression in the world nuclear market. They say, for the last five to seven years the West European suppliers of nuclear power plants have been facing a marked decline in demand and therefore have had to curtail their operations drastically. This, in turn has had a pronounced adverse impact on the economies of West European supplier countries.

These courtries had crashed into this market in the early seventies by committing staggeringly huge capital in the hope of cashing on a fast developing demand and in the process regaining their economic strength which was suddenly weakened by the oil crisis.

However, by the late seventies this projected demand had considerably slackened and the supplier countries were forced to readjust their programmes at a very high cost. Independent nuclear experts of Pakistan believe that the demand slackened in the spin-off of a clash of economic interests between USA, which just a few years ago had acquired the monopoly of world nuclear fuel supplies, and European suppliers of power plants who were also offering the technology of fuel fabrication and reprocessing in the package.

Apprehending that the fuel market would slip out of its hand completely, if those countries lacked nuclear technology were to acquire the capability of operating their plants with home made fuel, the USA, in the opinion of experts, brought political pressure to bear on West European suppliers and tried to stop them from passing nuclear fuel processing technology to the third world.

These experts believe that the factor of public opinion which is becoming increasingly anti-nuclear in West European countries was also partly responsible for curtailing of commercial nuclear activity in that part of the world.

The quick response of three West European nuclear suppliers to Pakistan's invitation is regarded by these experts as an indication that the Ruropean suppliers have refused to buckle under U.S. pressure. In the past too, despite U.S. disapproval, France sold a complete nuclear cycle project to Japan while West Germany supplied a similar plant to Brazil.

Recording Pakistan's own nuclear programme history, these experts said that because of the clash of economic interests between U.S. and the West European nuclear suppliers, this country's peaceful nuclear programme has suffered a great deal. As a consequence, they said, Pakistan will face an acute energy crisis by 1990.

Energy experts said that our conventional energy resources were very limited. They said, though hydro power was our major resource at the moment, it had constraints both due to the total amounts available and the rate and location at which it would be exploited. Most of the hydro resources are concentrated in the north and require high transmission costs to utilise the power generated at the load centers.

As the most favourable sites have already been exploited. The cost of constructing dams at new locations, most of which are in the siesmic region, is becoming very high. Nevertheless, in the opinion of these experts, from technological and economic points of view we can exploit only 40 percent of this resource and thus hydro could provide about 30 percent of the installed capacity requirement.

Talking of coal they said, the coal in Pakistan was not only limited in quantity but most of it was lignite and thus poor in quality and difficult to use for power production. And, contrary to the general belief, they added, gas reserves in Pakistan were not very large and would continue to be used for other valuable purposes. Moreover, gas, they said, was an important raw material and was needed in the manufacture of fertilisers and petrochemicals. In addition, there is its domestic use and we could not afford to burn it for power production.

Energy economists agree with this assessment. They said our total coal deposits, proven and probable, amounted to 437 million tons but when reduced to good quality coal, it corresponded to only 173 million tons. This may be compared with 81 billion tons of coal reserves in India.

With regard to gas, they said, our reserves of 26.4 million cubic feet corresponded to 724 million tons of coal and unless new discoveries are made our gas will be fully committed by 1988.

The oil situation is also not very happy. We are importing nearly 90 percent of our oil requirement at a cost now of 1.6 billion dollars which is estimated to go up to around 6 billion dollars by 1990. Oil economists insist that even after the exploitation of full potential of Khaskheli and Dhodak we will have an unbearable strain on our economy to further increase the cost of import of oil by using it for power generation on a large scale.

Besides, oil has several other important uses and it is not optimally economical to burn it for power production, they added. In this regard, they declared, it should be noted that even those countries which have surplus oil reserves were turning to nuclear energy to meet their power demands.

And finally, they said, even if we succeed in striking indigenous reserves of oil, we will have to depend upon other more economical sources of power in view of the growing consumption of oil and its increasing prices.

Independent economists give full credit to Pakistan Atomic Energy Commission for taking in hand a comprehensive nuclear programme at a very early stage. The 137 MW Kanupp [expansion unknown] plant is the product of the commission's planning which began as far back as 1961. The ECNEC [expansion unknown] approved the plan in 1964 and the turn-key contract was signed with the Canadian General Electric Company in 1965. Construction work on the plant began in 1966 and the project was completed by the middle of 1971 and commissioned in 1972.

After this first step, the commission chalked out an elaborate but economically realistic nuclear programme. The goal was to generate by the end of the century 30 percent of total electric power generation in the country or 5500 MW out of 18,000 MW, through the nuclear source. In this connection it was planned to build a 500 MW station in the north and another dual-purpose plan with a nominal output of 400 MW and 100 million gallons of fresh water per day at Karachi.

The tentative target for the completion of the plant in the north was 1979, the dual-purpose plan was to be completed in 1982-83. After 1985 the country was to start building a series of nuclear plants with capacities ranging from 500 to 700 MW at relatively short intervals to keep pace with the growing demand in the country.

Simultaneously, the commission had begun exploring the possibility of acquiring fuel production capacity. Explaining the reasons why we needed this capacity Dr Munir Ahmed Kah, chairman of Pakistan Atomic Energy Commission told a gathering of Pakistani engineers in 1979 that "power reactor normally burns on to three percent of uranium after which, because of fission products produced in the fuel, the reactor loses its ability to sustain chain reaction. The burnt fuel is, therefore, discharged and fresh fuel added. We can reuse this discharged fuel provided we remove the poisonous fission products and clean up the uranium and separate plutonium which is produced in the reactor. A processing plant is used to perform this operation."

At about the time the possibility of setting up a reprocessing plant was being studied, Pakistan started prospecting for uranium, actual drilling work began near Dera Ghazi Khan under a UNDP financed project. Soon the efforts began yielding results. If the D. G. Khan reserves add up to 5,000 tons of uranium it would be sufficient for meeting our power requirements for a long time to come, said a nuclear scientists.

The PAEC's [Pakistan Atomic Energy Commission] nuclear programme also included the setting up of a fuel fabrication plant which came on stream in 1980. This enabled Pakistan to meet the energency that occurred when the Canadians put an embargo on the supply of nuclear fuel and spare parts to Kanupp in December 1976.

However, the entire nuclear programme of Pakistan was jeopardised when France broke its agreement to supply a nuclear reprocessing plant. The nuclear power plant which was to be set up in the north was affected most, because civil work on this plant located at Chashma was reportedly completed on schedule. Activity on the project was slowed down considerably in later years because of ensuing uncertainty. It may be recalled here that, meanwhile, the power generating capacity of the proposed plant had been increased to 600 megawatt.

Despite the reverses, the Pakistan Atomic Energy Commission continued to proceed with the planning for the project and kept up its search for adequate financial and technological resources for completing it. Finally, after having increased the generating capacity of the proposed plant to 900 MW, in view of the time lost and the difficulties expected to be faced in implementing the earlier comprehensive programme of locating a number of power stations at various places in the country by 1990, the Commission reportedly approached the International Atomic Energy Commission for their approval to invite bids for construction of the plant. It is of interest to note that the Chashma plant is comprehensively covered by all the safeguards of the IAEC [International Atomic Energy Commission].

Independent nuclear scientists have expressed their satisfaction over the condition of the tenders that bidders should give a five year supply of fuel initially as a part of the package and also enter into contract for another 15 years beyond five years for the supply of material and components including uranium. They also noted with satisfaction the fact that Pakistan will negotiate for arranging uranium from the domestic resources and ask for enrichment facilities.

CSO: 5100/4314

PAKISTAN'S STEPS FOR SAFEGUARDS REVIEWED

Karachi DAWN in English 3 Dec 82 p 19

[Article by Syed Sikander Mehdi]

[Text] THOUGH its immediate strategic environment has already been nuclearized by nuclear India and nuclear Israel for several years now, and critical developments almost taking root in neighbouring Afghanistan hurl unacceptable vulnerabilities for Pakistan, the country seems determined not to be swayed away by the strong and all-engulfing nuclear temptations for crossing the threshold.

Indeed, not as yet, has Pakistan lost all its hopes in controllong the bomb through multilateral and multinational co-operational efforts, and as such, has consistently been playing a remarkably constructive role in strengthening the fragile and 'toothless' international nuclear safeguards system.

Pakistan's ambassador to the United Nations has reaffirmed his country's unwavering commitment to nuclear non-proliferation. During a debate at the General Assembly on the annual report of the 110-member Vienna-based International Atomic Energy Agency's (IAEA) on November 18, ambassador Shahnawaz said that 'certain additional safeguards' were accepted by Pakistan for keeping the Karachi Nuclear Power Plant (KANUPP) operational.

Operative since 1972, the 137 mw KANUPP is the only atomic power reactor in Pakistan and it is already a comprehensively safeguarded facility. Hence, the acceptance of additional safeguards means keeping all the windows closed for possible nuclear ride through the KANUPP route. It seems that Pakistan's excessive dependence on external sources of nuclear supply, the fragility of its own nuclear base and capabilities and its continuing hope in the international safeguards system form the basis for such an important decision, though some may still argue that it is a time-buying plotting against the international safeguards regime.

But only those who are not properly acquainted with the background and dynamics of nuclear planning in Pakistan may venture such a suggestion.

Pakistan is a late starter in the field and unlike other nuclear proliferators, including the Soviet Union, Great Britain, France, China and even India, its interest in nuclear technology was not aroused by strategic considerations but by the Atom for Peace Campaign of President Eisenhower. That's why the indigenously-built Indian APSARA research reactor as early as in 1956 did not propel Pakistan to embark on a nuclear programme on a large scale. Neither APSARA, nor subsequent nuclear achievements in India prompted Pakistan to build un-safeguarded nuclear facilities as well.

It may be added that even the most controversial nuclear deal with France for a reprocessing plant — a deal both signed and cancelled in the 1970's — was also to be a rigorously safeguarded facility. Again, even when India had exploded its atomic device at Pokharan on May 18, 1974, Pakistan did not respond by instantly weaponising its nuclear programme. Far from this, Islamabad deplored India's action, called for nuclear protection by the nuclear weapon powers, sought to organise an international conference of the non-nuclear countries, called for de-nuclearising South Asia and for establishing South Asia as a nuclear free zone and also offered to open its installations for inspection by India provided India also reciprocated. Pakistan also called for strengthening the international safeguards system and castigated the nuclear-supplier countries for their role in arousing nuclear nationalism in the developing countries.

Ambassador Shahnawaz said at the United Nations General Assembly on November 18, that the IAEA safeguards system was reliable and effective and its technological scope could be comprehensively applied to any category of nuclear installations and facilities. As far its own conduct, Pakistan does observe the rules at the game. It has allowed KANUPP to be subjected to regular safeguards inspection and the 70 such inspections of the plant, since it became operative in 1972, carried out so far had satisfied the IAEA of Pakistan's compliance with the terms of the safeguard agreements. Now Pakistan has agreed to accept some additional safeguard measures at KANUPP including installation and re-location of surveillance equipment, installations of fuel bundle counters and application of underwater sealing system of spent-fuel tray-stacks. Such a compliance clearly indicates the direction of atomic planning in Pakistan.

Today the world is critically nuclearised with a total stockpile of 40-50.000 strategic and tactical weapons with an explosive power of one million Hiroshima-type bombs. This is an equivalent of 3 tonnes of TNT for every man, woman and child on earth. By itself, one single two-megaton nuclear warhead has an explosive power equal to all bombs dropped by the United States on Germany and Japan in the second world war. Over 90 per cent of all nuclear warheads are in the hands of the two superpowers. Hundreds of thousands of best brains of these countries and their allies are busy in further sharpening the nuclear teeth.

CSO: 5100/4312

ESCOM DENIES INVOLVEMENT IN DEVELOPING NUCLEAR ARMS

Johannesburg RAND DAILY MAIL in English 30 Nov 82 p 3

[Article by Chris Olckers]

[Text] TOP foreign nuclear experts will still be approached with offers of jobs in South Africa, in spite of claims by the British Labour Party that the scientists are helping the country to develop nuclear weapons.

A senior Escom official yesterday categorically denied these claims.

"We are most definitely not involved in the development of nuclear weapons.

"Our prime concern is the expansion of our power resources.

"Nuclear armanents is most positively not the brief of Escom," he said.

The row over foreign scientists joining Escom broke out after the decision by a top British nuclear power station expert to join Escom on a full-time basis.

Mr Tony Gopsill, former deputy director of the Hinckley Point reactor at Somerset, joined Escom in 1981 on a loan basis, but later decided to stay on with the organisation.

The liberal London daily, The Guardian, claimed in a front-page report at the weekend that the men could be contravening the British Officials Secret Act and said their coming to South Africa was a serious brain drain.

The newspaper also claimed that the scientists could be revealing British national security information.

But the Escom spokesman said the organisation would continue to employ foreign experts who would be able to assist with the expansion of its energy programme.

"These people don't only help us with the development of our own energy programme, but are also heavily involved in our intensive training operation for South Africans.

"We will continue to recruit foreigners with the expertise that will be of invaluable assistance to this country.

"They have not and will never be involved in the development of so-called nuclear weapons," the spokesman said.

CSO: 5100/11

CAPE RADIATION UNIT FOR TYGERBERG HOSPITAL

Johannesburg RAND DAILY MAIL in English 1 Dec 82 p 5

[Text] CAPETOWN--Radioactive contamination could complicate a conventional injury to a radiation worker at any nuclear power station, a member of the Executive Committee of the Cape in charge of hospital services said yesterday.

Mr P J Loubser was speaking at the opening at Tygerberg Hospital of a special unit to cope with this type of injury.

The unit, known as the Tygerbert Radiation Casualty Facility (TRCF), has been paid for by Escom as an extension of its medical facilities for the Koeberg power station.

It will also be available for the treatment of contaminated accident cases from other places handling radioactive materials, such as nuclear medicine departments in hospitals, the Council for Scientific and Industrial Research's new accelerator near Faure, and industrial users.

The hospital's plastic surgery department will use the facility for certain operations, thus keeping it in a state of readiness.

And a team of doctors and nurses from this department will be trained in radiation casualty treatment.

The plastic surgery department was selected because the type of operation for which the TRCF will be routinely used can be terminated at short notice.

"South Africa has made use of experience from other countries to make the Tygerberg Hospital radiation casualty facility among the best equipped in the world," Mr Loubser said.

CSO: 5100/11

PELINDABA CONSIDERED KEY TO US-SA NUCLEAR BONDS

Harare THE SUNDAY MAIL in English 28 Nov 82 p 7

[Text] AN announcement in the Johannesburg Star invites electronics engineers and technicians and promises them "interesting work in servicing sophisticated systems". The address beneath the announcement in small print is: P/O 256, Pelindaba.

In racist South Africa the word Pelindaba is pronounced in a whisper, because it is connected with a secret strictly kept by the authorities.

Here, in the province of Transvaal, 30 km west of Pretoria, the country's main nuclear centre is hidden behind a blank wall with barbed wire entanglements and protected by armed guards.

The centre was built in the mid-60s, when the country's ruling clique accelerated its nuclear programmes and nuclear build-up.

TRAINED

Pelindaba can by right be called a fruit of American-South African collaboration. Apart from the first nuclear reactor, the US$11 million Safari-1, designed and installed by the US in South Africa, about 100 South African nuclear physicists have been trained in US laboratories.

Also, the Americans provide Pretoria with regular supplies of primary nuclear material, enriched uranium, and in 1974 extended their contract for another half century.

The US cannot shed the responsibility for having reared an "illegitimate nuclear child" (South Africa stubbornly refuses to sign the nuclear non-proliferation treaty) and continuing to be its guardian angel.

A proof of this is a recent visit by a high-powered American delegation of nuclear experts to the top-secret uranium enrichment plant in Walindaba, located near the research centre.

It was a reciprocal visit and, commenting on the exchange of delegations of nuclear experts, Time magazine has called it a key step towards renewed bilateral nuclear co-operation.

Under the South African military doctrine, nuclear arms are regarded as an indispensable tactical weapon in a future war against certain African countries and national liberation movements. The South African militarists are frenziedly preparing for this war and are building up their military, including nuclear, potential.

A missile-testing site near Lake Saint Lucia in Natal, 40 km from the Mozambique border; silos with death-sowing cigar-shaped missiles trained on Maputo, Luanda and other frontline capitals; the Simonstown base equipped with sophisticated electronics in the event of a nuclear war — the list of installations of indubitable purpose can be continued.

By the way, even after

satellite detected nuclear test preparations in the Kalahari Desert in August 1977 and the South African government, caught red-handed, had to beat a retreat, the installations there were not dismantled.

American propaganda has gone a long way to spread the inventions that the mysterious flashes in the atmosphere were only "meteor flares". Numerous facts show otherwise: In September 1979 and December 1980 South Africa, probably in conjuction with Israel (the two countries have been co-operating in the nuclear field for many years), conducted nuclear testing.

Recently a report prepared for the Pentagon by two prominent American nuclear experts was published. The authors of the report, retired General A. Knight, now a consultant at the Stanford Institute of Strategic Studies, and K. Adelman, American deputy representative at the UN, unanimously agree that South Africa has enough technological and economic potential for nuclear arms production.

They stress the country's readiness to use this potential if "the politico-strategic situation" so requires.

Open declarations of this are made by nuclear-minded leaders of the National Party who place their trust in the launch-button for "the saving of the Afrikaner home" — another word for a caste state built on total inequality because of skin colour and merciless exploitation of the majority of the population.

POWERFUL

Standing out among these leaders is Lucas Daniel Barnard, the current chief of the National Intelligence Service. The swift rise of the young university professor to the powerful rank of the head of the South African Intelligence Service is not explained by ostensibly outstanding academic knowledge.

What explains it, Knight and Adelman believe, is that he heads the nuclear lobby in the South African establishment and is among the most zealous advocates of nuclear weapons.

His influence in the higher echelons of power and closeness to the government prove that his hawk views are fully shared by the country's leadership.

Crying from the roof-tops about its "peaceful intentions concerning the use of the atom" the South African leadership may even hint, as it did recently through Foreign Minister R. Botha, that "under certain circumstances" Pretoria would revise its negative attitude to the nuclear non-proliferation treaty. In reality, however, the final say belongs to the likes of Lucas Barnard, who develop the strategy of "the pre-emptive and deterring nuclear strike",

CSO: 5100/10

BRIEFS

RHAPSODIE REACTOR HALTED--The first French experimental fast neutron reactor, cooled by liquid sodium, built on the Cadarache site, which had been stopped last January as a result of a nitrogen leak, will not be restarted. After 15 years of good and loyal service this reactor, with an initial power production of 24 megawatts, later raised to 40 megawatts, has produced 1,827 million kilowatts of thermal energy over a period of 2,703 days of production at full power. It gave complete satisfaction as far as fuel experiments are concerned, since more than 30,000 rods have been irradiated. From now on, the "Phenix" reactor will replace this faithful servant in fuel qualification trials. Let us point out also that the "Superphenix" reactor at Creys-Malville, derived from the "Phenix" and is an achievement on the European scale of 1,200 megawatts, is nearing completion. The CEA (Atomic Energy Commission) stated that the termination of Rhapsodie will be full of lessons on the long-term behavior of components. [Text] [Paris ELECTRONIQUE ACTUALITES in French 29 Oct 82 p 4] 6445

CREYS-MALVILLE BREEDER REACTOR FINANCING--BNP (Banque Nationale de Paris) and the Indosuez Bank, the major partners in an international consortium of banks, signed an agreement in Lyon for a 45 million ECU (European Currency Units) credit to NERSA (Societe Centrale Nucleaire a Neutrons Rapides SA). This contract is part of the financing program for the fast breeder super-phenix Creys-Malville reactor, a European project nearing completion and which will result in 1984 in an advanced nuclear plant capable of producing 70 times more energy from uranium than traditional nuclear plants. The 10-year credit stated in ECU's, can also be used depending upon the borrower's choice, in Eurocurrency. [Text] [Paris LES ECHOS in French 12 Nov 82 p 8] 6445

BETTER 1983 NUCLEAR PLANT PERFORMANCE--Electricite de France [EDF] is anticipating a better performance of its nuclear power plants in 1983. During a visit to the Bugey plant, in Ain, where two of the four reactors had to be stopped to replace defective mechanical parts, Mr Pierre Rolland, of the thermal production department of the EDF, just stated that "we can expect to go back to a 62 percent availability level for French nuclear power plants in 1983." The three reactors Bugey 4, Bugey 2, and Fessenheim 1 will get back on line and supply electric power to the EDF network around 15 December, before the year-end, the period in which it is the most difficult to satisfy electrical energy demand in the dead of winter. [Text] [Paris LES ECHOS in French 15 Nov 82 p 6] 6445

CSO: 5100/2521

SPECIFICATIONS FOR HEAVY ION LINEAR ACCELERATOR TANDEM XTU

Milan SCIENZA E VITA NUOVA in Italian Nov 82 p 72

[Article: "Faster With the Tandem"; for further information see JPRS 82336, 29 November 1982, No 170 of the Nuclear Development and Proliferation WORLDWIDE REPORT, pp 52-56]

[Text] The project that led to the building of the Tandem XTU was launched in 1975 and directed from the beginning by Prof Renato Angelo Ricci, professor of general physics in the University of Padua. It is an electrostatic machine that accelerates, at various energies, beams of ions of the most varied kinds, from the simplest, such as hydrogen and helium, to the most complex, such as calcium, iodine, and all the way to uranium, using very large differences in potential in two successive stages--whence the name "Tandem."

Let us recall that an ion is an atom that possesses a positive or negative electrical charge, because of the fact that its electronic layout has been modified in some way and does not equal the positive charge of the nucleus. In simpler terms, one can "manufacture" an ion by adding or subracting one or more electrons from the total store of electrons that it possesses when in the neutral state.

At the input of the Tandem accelerator is a source into which the elements that it is desired to use as projectiles are inserted. These projectiles are first ionized negatively--that is, "clothed" with one or more electrons--and inserted through a series of directional magnets into an electrostatic field that can reach 16 million volts. This field impresses on them a speed that accelerates them to the point of making them collide against an obstacle provided for the purpose (a gas or solid) that ionizes them, positively this time--that is, depriving them of electrons. In this way, the second stage, with reversed tension, accelerates them further, up to the speed necessary for bombarding the target. Continuing to travel in a vacuum 10,000 times more complete than that of a light bulb, the ion beam arrives at a magnet that directs it into one of the terminals where the targets are situated, through guides provided for the purpose, from 7 to 10.

Here the reaction that interests the researchers takes place: a series of detector instruments connected with pulse analyzers and minicomputers identifies the events, which are finally recorded and analyzed, in accordance with the experimental program established, by the computer proper, which is capable of processing up to 350,000 data per second.

In order to study the behavior of the nuclei--that is, in order to do nuclear physics--it is necessary for the energy possessed by the accelerated ion that hits the target to be sufficient to overcome the Coulomb barrier--that is, the forces of an electrostatic nature. This energy depends on the difference of potential produced by the machine and the ionization number obtained by divesting the element of its electrons.

Let us see, then, what happens to a sulfur ion accelerated in the Tandem. First, an appropriate source "clothes" it with electrons and puts it into the first acceleration stage. Here the ion undergoes a first 16 million-volt "boost" and acquires an energy of 16 million electronvolts--that is, 16 MeV. At the terminal of the first stage, there is the "undressing," and the ion acquires, for example, 10 positive charges (that is, it loses 10 electrons as against what it possessed--16--in neutral conditions) and is further accelerated by the reversed electrical field of the second stage.

The final energy acquired is therefore equal to the energy of the first stage (16 MeV) increased by the energy obtained by multiplying the charge acquired in the second stage by the further difference in potential of 16 million volts. In toto, 16 + (10 X 16) = 176 MeV. In order to compare machines of this type, this energy is then referred to the individual nucleon: in our example, if the sulfur nucleus is formed of 32 nucleons (protons plus neutrons), the Tandem furnishes 5.5 MeV per nucleon.

The Legnaro accelerator is currently the most powerful of this type in Europe. To achieve higher energies, one can use a linear accelerator such as the Tandem connected to a cyclotron; this is what has been done at Berkeley with the Bevalac, and probably will be done in Catania within the framework of an INFN [National Institute for Nuclear Physics] project still being worked out.

11267
CSO: 5100/2528

SAFETY OF ALMARAZ NUCLEAR POWER PLANT QUESTIONED

Madrid TIEMPO in Spanish 18/25 Oct 82 pp 36-39

[Article by Jesus Rivases; research by Jose Ruiz and Emilio Jaraiz]

[Text] The Almaraz nuclear power plant began to operate once again on 26 September 1982, in the midst of a great controversy between those who point out the risks entailed in the plant's operation, and those who feel that it is completely safe. Its critics talk about birds that die if they fly over the plant, about strange types of algae that grow in nearby swamps, and of spontaneous abortions in women in the area. Its supporters, in addition to pointing out its absolute safety, speak of the advantages, primarily economic, that Almaraz would provide for the province.

On 25 September, a day before Almaraz was started again, the Spanish Nuclear Forum, speaking through its public relations service, stated that "the safety of Spain's nuclear power plants is absolutely equivalent to that of the nuclear power plants of any other industrialized nation. The safety standards in effect in Spain are comparable to the most stringent standards required in any of these countries."

Nonetheless, the Forum also said: "It is possible that a large part of public opinion may wonder whether, if such standards do exist, they are actually complied with. Because that is what is important."

According to Francisco Pascual, the head of the Nuclear Safety Council, and Luis Magana, the commissioner of energy, if the Almaraz plant operates at 50 percent capacity there is no danger of any fissure, and consequently no danger of any leakage in the pipes of the plant.

Nonetheless, a number of knowledgeable sources have confirmed to TIEMPO that the Nuclear Safety Council has in its possession a series of reports based on data from the SNI [Swedish Nuclear Inspectorate], an organization responsible for monitoring nuclear power plants in that country, and from the U.S. NRC [Nuclear Regulatory Commission]. According to these reports, short-term solutions, such as the ones used at Almaraz, could cause more serious damage and directly affect safety.

The Almaraz nuclear power plant was officially inaugurated by the prime minister, Leopoldo Calvo-Sotelo, on 30 March 1981. When it was opened, the technical staff responsible for it assured the public that this was a model facility of its type, and that the most advanced technology had been used.

Just 5 months later, the nuclear reactor was to undergo its first shutdown because of damage. This was repeated the following month, and for the third time, a year after it was first opened.

Defects in the steam generator pipes were found at Almaraz. These pipes are in contact with the nuclear reactor, which is of the PWR [Pressurized Water Reactor] type. The steam generators consist of a large number of U-shaped tubes through which radioactive water from the primary circuit of the plant circulates. The primary circuit is in contact with the nuclear fuel and collects the heat released by the reactor.

In the Almaraz plant, the large amount of radioactive water circulating in the tubes of the steam generators caused corrosion to appear on the walls of the pipes; this could cause the pipes to crack. Similar cracks appeared in the Swedish plant of Ringhals last year.

Twin Plant

Nuclear power plants are built based on a reference model, which is called their twin plant. In the case of Almaraz, its twin is the Ringhals plant.

At the end of October 1981, the SNI ordered the halt of the Ringhals reactor, which is a 930-MW unit of the PWR type, supplied by Westinghouse. The SNI then informed the Spanish Nuclear Safety Council of its decision, and the Nuclear Safety Council in turn decided to shut down the Almaraz plant in the third week of November 1981. This decision was made in agreement with Westinghouse, the reactor's manufacturer.

Before that, in September 1981, Almaraz was halted for the month of September when a high level of moisture was found in the steam generator pipes. In March and April 1982 there was another shutdown when corrosion was once again found in the tubes, bringing with it the possibility of cracking. In August 1982, the plant was still closed, and just a few days ago, at the end of September, it began to operate once again.

Because of the Ringhals accident, the nuclear industry all over the world decided to reduce operation to 50 percent of capacity in plants affected by such defects. This decision affects the Almaraz plant, which was modeled after Ringhals, and the McGuire reactor in the United States, which served as a model for the Swedish plant.

Nonetheless, according to information obtained by TIEMPO, the problem is much more serious at the Almaraz plant, since there were a number of irregularities during its construction. Combined with technical defects, such as erosion in the Westinghouse pipes, there were a number of incidents of sabotage, ranging from improper welding to workers leaving hammers and wrenches inside the equipment.

This sabotage, according to the sources consulted by TIEMPO, was apparently caused by some workers at the plant who wanted the job to last longer, since the Almaraz area has one of the highest rates of unemployment in the region. It seems that the workers hoped these problems would be uncovered when the plant was inspected. Logically, such defects would have to be corrected, and the job would go on. And according to businessmen in the area, this was a job that paid extremely well.

To cite some specific instances, the plant has some employees whose only duty is to give out special protective clothing at the entrance of the secure area. When visitors or employees leave this area, they collect this clothing. Their monthly salaries are over 120,000 pesetas, and they work from 0800 to 1500. The rest of the Almaraz workers are paid according to a similar wage scale.

Because of the accidents, a number of environmental groups, along with the Extremadura Council, have begun to take action against the plant, or at least, steps to clear up the situation.

A Political Problem

Manuel Bermejo (UCD [Democratic Center Union]), the head of the Extremadura Council, told TIEMPO that "the issue is a very difficult one at this time, because of the number of interests involved. But we Extremadurans can not just get rid of this problem we have, because the issue is an important one, and because we must be sure that the plant is safe."

"We are not discussing," he added, "the pros or cons of nuclear energy. We are being accused of not being technically qualified and of having too little knowledge in this field. There are some who claim that the plant can operate in a regular manner. That may well be true. But here is the question. They have wanted to operate the plant, but that has not been possible. We don't know all of the reasons. These causes must be explained to us, and the plant will have to operate with maximum safety. And the Regional Council of Extremadura must be so informed."

Nonetheless, the position of the Extremadura centrists is being challenged by the opposition and is at times branded as a vote-getting maneuver. Specifically, the secretary general of the PSOE [Spanish Socialist Workers Party] in Caceres has leveled the following charge at the Regional Council: "At one time, the position of the Council was consistent, but this Council has been unable to withstand the pressures brought to bear on it. And right now the chairman of this Council is engaged in vote-getting maneuvers."

The tension felt by the local population was heightened by the news that there is no evacuation plan for the region in case of an accident. The Extremadura press has spoken of a Nuclear Emergency Civil Defense Plan, prepared with the assistance of 12 official organizations, including the Extremadura Council. However, admidst the general alarm, this plan has yet to be made public, which has caused some groups in Extremadura to think that no such plan actually exists.

The only report now known to be available for use is the DOAL [Document for the Use of Local Authorities]. This document was prepared by the civil government of Caceres in November 1981, and was later submitted to the members of the local government. The text of this document has now been obtained by ADENEX [Association for the Defense of Nature and Resources of Extremadura].

In the second chapter of the document it states that Navalmoral de la Mata will be the evacuation center for the area's residents. After the Harrisburg accident, the U.S. NRC established an evacuation area around the plant.

This area, with a direct risk of contamination, covers 16 kilometers. In that same 16-kilometer area, 20,000 people live in the vicinity of Almaraz. Navalmoral, which would be the evacuation center, is located 16 kilometers from the plant, inside the area considered dangerous.

Annex no 2 of the plan lists the roads that should be blocked in the event of an accident. The people who prepared the plan forgot to include the road connecting Plasencia with Navalmoral, which is just 10 kilometers from the facility. Apparently, while preparing the evacuation plan, they used an old map which does not show the new road, even though it is now the second most important in the area.

There Are No Instructions

According to the evacuation plans used in the United States, those persons affected by an evacuation order must be notified within 15 minutes. But in Almaraz, neither the local government officials nor the people have received any type of instructions or training. In the United States, a compulsory evacuation exercise is conducted every 5 years for the people living less than 16 kilometers in a straight line from the plant. This exercise is also extended to include people living within an 80-kilometer radius around the facility. In this larger area, it is felt that people run the risk of radioactivity received through ingestion.

Nonetheless, the people of Extremadura may take what consolation they can from the fact that Caceres, with Almaraz, is Spain's leading producer of electricity, with a capacity of 3,612,000 kWh, amounting to 12 percent of Spain's production. Because of Almaraz, Caceres receives a subsidy of over 500 million pesetas twice a year.

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